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COMPARATIVE MEDICINE IN EUROPE.

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Now that so many students find it necessary to continue their studies in some of the older countries, where from the experience of years and the munificent aid of governments the facilities are unsurpassed, I thought it might be of interest to you to hear something of the manner in which work is carried on, and of the character of the people.

My time was chiefly taken up with the veterinary school and in the pathological and bacteriological departments of the University in Berlin. The pathological institute of the University is at the Charité, the oldest and probably the largest hospital in the city. This hospital is on the opposite side of the street from the Veterinary School, so that no time need be lost in going from one to the other. Ample ground is given to these institutions in Germany, so that the surroundings are really beautiful, and those able to be about can enjoy loitering beneath the shady trees in pleasant weather in summer. The Veterinary School grounds cover about fifteen acres, with entrances from three different streets. The buildings are arranged in two quadrangles, those devoted to theoretical teaching forming the larger, while the clinical buildings form the smaller, quadrangle. The main building, facing on Louisen Strasse, is occupied as residences by the teaching staff. The physiological institute is in charge of Prof. Munk, and he certainly conducts it in a very able manner.

It is here that some of the first experiments were made in removing parts of the brain in dogs, on the theory that all of the functions of the body were under control of certain centres in the brain; he is a firm believer in the theory, and our president will remember some demonstrations in support thereof which we were allowed to witness. One dog operated upon was blind in the right eye, another in the left eye, and a third in both eyes. It certainly seems to one who is not thoroughly conversant with the matter that he has a good many facts in his favor. In the same building is the department of veterinary anatomy, while directly opposite is a fine new building devoted to human anatomy and histology, under the teaching of Waldeyer, one of the best, if not the best histologist living. This department belongs to the University, but is open to veterinary students on payment of a small fee. A splendid new building at the end of the quadrangle, opposite the main entrance, is the pathological institute for the Veterinary School; it is considerably larger than the Peter Redpath museum, and is most thoroughly equipped. A part of the raised basement is devoted to the preparation of specimens for the museum, and at one end a large room for making autopsies extends from the ground to the floor of the second story. This room has every possible convenience, and is even luxuriously fitted up; the floor is tiled and well drained. There is plenty of water, light and ventilation. The walls are tinted and the ceiling nicely frescoed. Adjoining this room, and connected with it by folding-doors, is the demonstrating room; the larger animals are mounted on trucks and wheeled into this room for demonstrations in making post-mortems three times a week. Seats are arranged in this room so that all of the students not engaged in making the autopsy can see perfectly all that is going on. The remainder of the first floor is devoted to private laboratories for the professor and his assistants, a bacteriological laboratory, and a large hall for microscopical demonstrations. Nearly the whole of the second story is devoted to a pathological museum. Some of the specimens are fifty years old, and many are rare and very interesting and instructive. Some very good work has been done at this insti-

tute, and Prof. Schutz, who is in charge at present, is keeping up its good reputation: he has just finished some original work on infectious pneumonia in horses; he claims to have isolated and cultivated a micro-organism which, when inoculated into the tissues of healthy horses, produces a disease corresponding in symptoms and post-mortem lesions with that seen in the clinics. Three horses inoculated subcutaneously developed the disease after a stage of incubation of from three to four days. Inhalations in a fourth horse failed to have any effect. Professor Schutz was one of the first to recognize the glanders bacillus, and in company with Löfler, originated the present method of staining them.

There is a large amount of material available at this institute. During the six months that I was there we had one hundred and fifty post-mortems on horses; and I would not pretend to say how many on the smaller animals. Probably ten or twelve small animals are sent there every day, but they are not all utilized. In addition to this, the organs of many animals dying from contagious diseases are sent for diagnosis.

The clinics are very large, and are divided into four sections: the medical, surgical and polyclinic for the larger animals, and the smaller animals clinic. There are on an average about two hundred and fifty horses as resident patients, and from thirty to fifty daily in the polyclinic. All sorts of operations are performed, and the material is well utilized for teaching. A feature of the medical clinic is the fine laboratories connected with it for microscopical and chemical analysis of urine, etc. In the smaller animals clinic are about seventy-five resident patients, mostly dogs, and from thirty to forty out-patients daily.

The pathological institute at the Charité, under Prof. Virchow, is so well known that very little need be said of it. The building itself does not compare with the veterinary pathological institute either in appearance externally or in arrangements internally. There is a large amount of material, however, and the teaching is good. Prof. Virchow is a very unpretending gentleman, and is so full of enthusiasm in his work that he at once wins the respect and admiration of his pupils. He never

seems to exhaust his subject, and perhaps his demonstrations are so long as to make them a little tiresome, lasting, as they often do, from half-past seven until nearly noon! They are very interesting, however, and, it is needless to say, instructive.

Bacteriology does not form any considerable part of the work done at the Charité. They do not object to it, but, on the other hand, they do not enthuse much over it. Koch's laboratory is supposed to be the place of places to study this branch of medicine, and in many respects it is the best place; if, however, they would look after the interest of their students a little more it would be better. Last August, for example, during Prof. Koch's absence from the city, the assistant in charge admitted twenty-six men to work in a laboratory intended to accommodate fourteen, and in which a larger number could not work with comfort; the consequence was that very many of the cultures were impure, and there was general dissatisfaction. It is a good place to study methods, however, and that is probably what most of us are after if we are to remain in the country but a short time.

Another most interesting and instructive place to one who has any taste for pathological work is the "viehof," or central slaughter-house. Nearly all of the meat eaten in Berlin is slaughtered at this place, and the inspection service is so well organized that nothing escapes detection. There are altogether about 152 persons connected with this department. There are 26 qualified veterinary surgeons and about the same number of assistants. Then there are 100 trained microscopists, mostly women, who examine the tissues brought to them. In addition to these, there is a comparative pathologist, to whom all doubtful points are referred, and the veterinary superintendent, who has charge of the whole department.

Any quantity of material is to be found here, and in the pathological laboratory some excellent work is done. Inoculations with tuberculous matter and with animal parasites are carried on here. Acitnonyces in hogs were first found by Dunker, the pathologist to this establishment. Probably there is no place in the world better adapted for studying parasites, and all animals harboring the larvæ of parasites, which in their adult stage may

develop in man, are consigned to the vat. The flesh of all animals suffering from any disease communicable or supposed to be communicable to man is confiscated. It is needless to say that the other departments are conducted equally well. Perfect cleanliness is required, and there is no confusion. The butchers have separate stalls of their own, and do their own killing, subject only to the general regulations.

I do not know very much about the hospital advantages for students of human medicine, but from what I could learn from my medical friends who were there at the time, and from the manner in which things are generally done in Berlin, I should say that they were unsurpassed.

So far as the cost of living in Berlin is concerned, if we can live as the German students live, it cannot be much. Few of us, however, would be willing to make our breakfast off cold sausage, dry bread and stale coffee; a dinner of mixed food, supplemented by a quart of beer; and a supper the same as breakfast. This, however, is the way in which all the students lived with whom I was acquainted, and they did good work on it, too. English-speaking people often try it, but they generally give it up in a short time, and to live as we are in the habit of living costs money there. I should say that from $35 to $40 per month was little enough to pay for comfortable lodgings and board in Berlin. Fees are low.

London, so far as veterinary education, and as near as I can learn with regard to human medicine, is not to be compared with Berlin, except from the important fact that one's native language is spoken.

On arriving in Paris it happened to be my good fortune to meet M. Pasteur in his laboratory. He is a very pleasant gentleman, of medium stature, and looking older than I believe he really is. This is probably due, to a great extent, to his hemiplegic condition. His laboratory is a very unpretentious affair, consisting of a long one-story building with numerous small, dark rooms, while in the cellar he keeps his menagerie of wild animals, or if not wild, at least mad. Rabbits and guineapigs form the bulk of his stock-in-trade. There are no dogs. His method of

inoculation is very simple, consisting, as you are probably aware, of the injection of a small piece of medulla of a rabbit, macerated in beef broth, into the sub-meningeal space of a healthy animal. As soon as the inoculated animal dies, the medulla and about two inches of the cord are suspended in a glass vessel which has been previously sterilized, and in the bottom of which, to the height of about one inch, broken pieces of caustic potash have been placed. This cord is allowed to stand a certain length of time, varying according to the virulency which it is wished to obtain, those one day old being considered twelve times as virulent as those twelve days old. Human patients are treated by injections made in precisely the same manner as that used for inoculating rabbits, in which check inoculation experiments are carried out. Human beings are inoculated hypodermically, alternately in the right and left umbilical regions. A great many people present themselves for treatment, and, without doubt, very many of them have never been exposed to the virus of rabies; but, on the other hand, some have been bitten by dogs which, so far as could be judged from symptoms and post-mortem appearances, were rabid. I remember one case in particular, where a policeman was bitten in the hand by a dog supposed to be mad. The dog was sent to the veterinary school at Alfort, and a post-mortem examination was made by Professor Nocard, an authority on the subject, who unhesitatingly pronounced the dog rabid. The policeman went to Pasteur's laboratory, where he was treated, and when I left he had developed no symptoms of hydrophobia.

They do not pretend in Paris that the treatment is curative when once the symptoms of hydrophobia have developed. It is simply preventive. That it is preventive they most conscientiously believe in Pasteur's laboratory. Many, however, do not believe it is even preventive, and that those who have escaped the evil results of the bite would have escaped had they never seen nor heard of Pasteur or his treatment. Perhaps one of the strongest opponents of the system is M. Colin, of the Alfort Veterinary School. He says in plain terms that Pasteur has killed more than he had cured; that the great majority of the

human race are insusceptible to the action of the virus, and that ordinary precaution renders the action of the virus nil on most of those who are susceptible. He has proved, he says, "that the poison is very slightly soluble in water, blood or serum, and that, consequently, the application of the cautery even two or three hours after the bite has been inflicted acts as a specific by destroying the virus."

I had an opportunity of studying the disease clinically at the Alfort Veterinary School in seven or eight cases. The symptoms vary so much, and the post-mortem appearances are so little characteristic that I do not believe a veterinary surgeon would be warranted in giving a certificate that an animal died of rabies unless he could produce the disease in another animal by inoculation. It may here be said that the law in England is such that he must have a license to inoculate, and before he could get that the patient might die of hydrophobia. It is high time the anti-vivisection laws in that country were repealed or at least modified.

Rabies in the dog may occur in two forms, known as furious rabies and as dumb rabies. The one form often merges into the other, however. That there is a specific disease called rabies is beyond all doubt, though it is often very difficult to diagnose. The first symptoms are dullness, bad temper, loss of appetite, etc. There is generally a peculiar expression about the eye very difficult to describe, but never to be forgotten when once seen. It is a wild stare, the eye-balls are very prominent, and the animal seems frightened. Clonic spasms soon come on and they are accompanied by a peculiar high-pitched howl. The mucous membranes highly injected. There is seldom any frothing at the mouth, but sometimes shreds of mucus may be seen hanging from the jaw. Soon the lower jaw becomes paralyzed, and drops. Paraplegia comes on gradually, and the animal dies. They will not eat food, as a rule, but will swallow all sorts of indigestible substances, such as bits of rags, leather, etc. After voiding their urine they will invariably turn about and lick it up, and they will often eat their fæces. It is a mistake to think that dogs are always inclined to bite when rabid; very often

they will snap at everything in their way, but I have seen them when furious refuse to bite at a stick even though it was thrust into their mouths.

As I said before, the post-mortem changes are neither prominent nor constant. There is generally intense hyperæmia of the mucous membrane of the stomach and sometimes of the whole intestinal tract. The pia and dura maters are generally engorged. Oftentimes the stomach is filled with foreign matter, while there is no food present. The presence of this foreign matter in the stomach, together with the absence of food, the hyperæmia of the stomach and of the meninges, taken in connection with the clinical history, is considered sufficient evidence upon which to form a diagnosis. Of course if the disease can be reproduced, there can be no doubt as to its nature.

M. Pasteur's rabbits do not have rabies in its furious form. Progressive paralysis, beginning after a definite stage of incubation and ending fatally, is the only diagnostic symptom; hence it is that many have denied that these animals had rabies at all. One thing is sure, however. These animals suffer from a disease accompanied by constant symptoms, and inoculable from one animal to another; and that inoculations from a rabid dog produces a disease the symptoms of which are identical with those presented by M. Pasteur's experimental animals. Moreover, if statistics can be relied upon, the number of deaths from hydrophobia in the Paris hospitals have greatly decrecsed in the past three years, or since preventive inoculation has been practised. We are led to believe, therefore, that however far from perfection his methods may be, he is on the right track, and we most certainly hope that success may crown his efforts, and that his remedy may be made not only preventive, but curative.